

Richmond Refinery LPS Bulletin-Reliability

Alky- V-1421 Piping Failure

(3/9/2012)



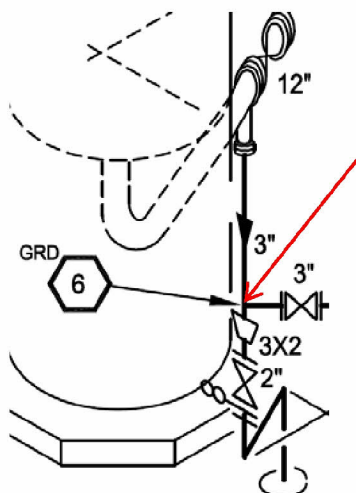
IMPACT ERM
Loss ID# 33325

Location:

Alky Plant
Cracking Division

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Isometric drawing showing location of failure. New Grid UT inspection point #6 is now active.

Tenets of Operations Violated:

- 1) #2 – Always operate in safe and controlled condition.

Incident Description:

On March 9, 2012, an Operator found a pipe leaking in the Alky during routine rounds. The line was isolated in order to make repairs. The leak occurred on a 3" carbon steel drain line just off the main outlet of the economizer, V-1421. This section of the line is an occasional use line for shutdowns/startup.

An investigation was initiated to determine why this piping had failed.

Investigation Findings:

- 1) The failure occurred due to under deposit corrosion located on a dead leg section of piping from original 1995 installation. The failure occurred at a tee branch connection on the dead leg piping. The tee surface collected deposits as they fell from above.
- 2) There was no inspection monitoring point on the tee to monitor for under deposit corrosion due to the dead leg condition of the piping.
- 3) The piping circuit was not placed on appropriate inspection frequency per API 570 in the study performed in 2000 for the refinery. The piping was classified as a Class III section of piping and should be classified as a Class I due to light end hydrocarbons in the system.
- 4) Radiographic examination was performed on this piping system in the past, but not at the tee location where the failure occurred.

Lessons Learned:

- 1) Radiographic examination may not locate or find all defects that can be detected using Grid UT method.

Recommendations:

- 1) Review piping isometrics so that the proper API 570 classification will be assigned to this system. This action will determine the appropriate frequency for the inspection(s), the number of inspections conducted, and the required number of inspection monitoring points.
- 2) Review inspection plans for piping to verify that the appropriate inspection technique is being used and the proper inspection points are being evaluated based on the type of failure that may occur or could be expected in that system.
- 3) Install the block valve just off the main 12" line from V-1421 to reduce the length of dead leg on this piping during the next S/D.

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